

Opening A Gym In The Netherlands

Coursera Capstone Project

Ranking locations for a new gym

Opening a new gym is a costly and risky operation, selecting a location with the right criteria will help us:

- Reach the broadest audience
- Avoid the competition

Data Acquisition

- City data in the Netherlands
https://en.wikipedia.org/wiki/Template:Largest_cities_of_the_Netherlands
- Obtaining postal/area codes per city
<https://www.geonames.org/>
- Retrieving gyms and other venues per area
<https://www.foursquares.com/>

The data was merged and cleaned to create tables of venues per area, with their location data

Methodology

- Find the 3 cities with the fewest gyms per capita
- Group areas together based on similarity by most common venues
- Identify the areas that have a lower amount of gyms than others in their group

Area codes in the Netherlands

Place	
Amsterdam	81
Rotterdam	79
's-Gravenhage	61
Utrecht	46
Almere	43
Groningen	43
Eindhoven	34
Haarlemmermeer	33
Apeldoorn	33
's-Hertogenbosch	30
Tilburg	28
Arnhem	26
Zwolle	25
Breda	25
Nijmegen	25
Zaanstad	23
Enschede	23
Haarlem	20
Amersfoort	18
Leiden	16

Total number of areas in each city

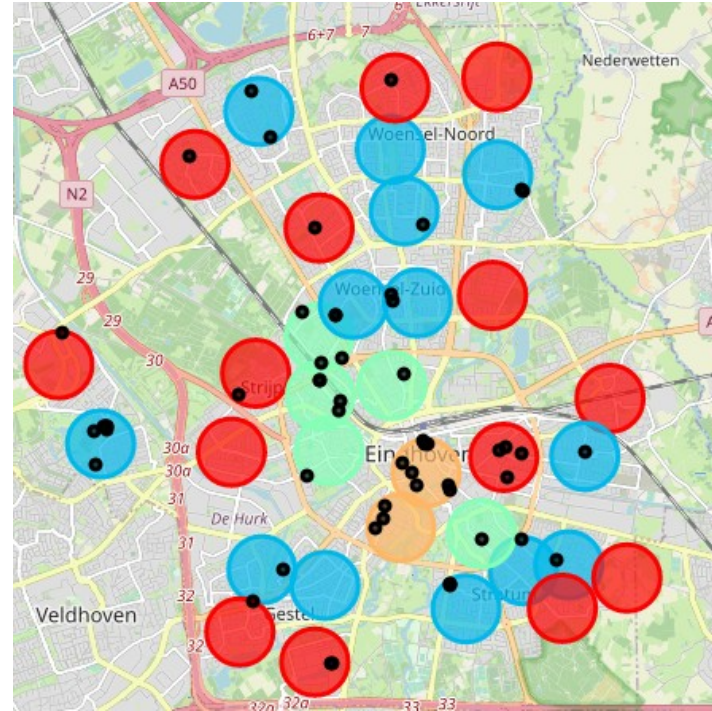


Map of the Netherlands with a marker for each location

Clustering and gym locations



Clustered areas by Kmeans



Clustered areas with marked gym location(black)

Results

Here we see the population/gyms ratio for each city. The bottom 3 are the cities with the relatively fewest amount of gyms.

	City	Population	Total Gyms	gym density
1	Haarlem	162,864	65	2505.600000
3	Utrecht	357,179	134	2665.514925
9	Leiden	125,434	44	2850.772727
0	Amsterdam	872,680	294	2968.299320
8	Zwolle	128,617	38	3384.657895
2	's-Gravenhage	544,766	158	3447.886076
5	Zaanstad	156,703	44	3561.431818
5	Groningen	232,826	62	3755.258065
7	Almere	211,514	55	3845.709091
6	Tilburg	219,632	57	3853.192982
0	Apeldoorn	163,706	42	3897.761905
9	Nijmegen	177,818	45	3951.511111
1	Rotterdam	650,711	164	3967.750000
8	Breda	184,403	45	4097.844444
2	Arnhem	161,260	39	4134.871795
4	Eindhoven	234,235	56	4182.767857
4	Amersfoort	157,286	35	4493.885714
6	Haarlemmermeer	155,770	34	4581.470588
7	's-Hertogenbosch	154,989	32	4843.406250
3	Enschede	159,934	31	5159.161290

These are the postal codes corresponding the the locations that have fewer gyms than their group average.

	Postal Code	Cluster Labels	Venue	Venue Average	Municipality
0	5211	3.0	4.0	4.363636	's-Hertogenbosch
1	5247	2.0	1.0	2.239216	's-Hertogenbosch
2	5215	2.0	2.0	2.239216	's-Hertogenbosch
3	5391	2.0	1.0	2.239216	's-Hertogenbosch
4	5242	0.0	1.0	2.704545	's-Hertogenbosch
5	5243	2.0	1.0	2.239216	's-Hertogenbosch
6	5221	2.0	1.0	2.239216	's-Hertogenbosch
7	5234	2.0	2.0	2.239216	's-Hertogenbosch
8	5241	2.0	1.0	2.239216	's-Hertogenbosch
9	5233	2.0	1.0	2.239216	's-Hertogenbosch
10	5235	0.0	2.0	2.704545	's-Hertogenbosch
11	5213	0.0	1.0	2.704545	's-Hertogenbosch
12	5236	0.0	2.0	2.704545	's-Hertogenbosch
13	5237	2.0	2.0	2.239216	's-Hertogenbosch
14	5223	2.0	2.0	2.239216	's-Hertogenbosch
15	5232	2.0	1.0	2.239216	's-Hertogenbosch
16	7546	0.0	1.0	2.704545	Enschede
17	7548	2.0	1.0	2.239216	Enschede
18	7531	2.0	1.0	2.239216	Enschede
19	7545	0.0	1.0	2.704545	Enschede
20	7514	4.0	4.0	4.016129	Enschede
21	7511	4.0	4.0	4.016129	Enschede
22	7535	2.0	2.0	2.239216	Enschede
23	7513	0.0	2.0	2.704545	Enschede
24	7544	0.0	2.0	2.704545	Enschede
25	7543	0.0	1.0	2.704545	Enschede
26	7512	0.0	2.0	2.704545	Enschede
27	7521	0.0	2.0	2.704545	Enschede
28	1171	0.0	1.0	2.704545	Haarlemmermeer
29	2134	2.0	2.0	2.239216	Haarlemmermeer
30	1119	2.0	1.0	2.239216	Haarlemmermeer
31	2131	2.0	2.0	2.239216	Haarlemmermeer
32	2154	2.0	1.0	2.239216	Haarlemmermeer
33	2144	2.0	1.0	2.239216	Haarlemmermeer

Discussion

- Real estate value and availability should be considered as well
- Distance to the closest gym could provide more accurate insights
- Search by postal codes not optimal, no uniform area size

Conclusion

- We found a list of 40 locations that are a good starting point for further research
- Clustering model can be finetuned further
- Location data can be improved
- Other data can be incorporated as well

